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ORIGINAL ARTICLE

# Prevalence of Hepatitis B amongst Pregnant Women

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## ABSTRACT

**Objective:** To study the prevalence of hepatitis B virus infection amongst pregnant women.

**Subjects and Methods:** A hospital based cross-sectional study was conducted among pregnant women who attended antenatal care clinic for routine pregnancy check-up from July 2016 to February 2017. Sample size was calculated by using WHO sample size calculator and 900 pregnant women were enrolled in the study. Data were collected by face to face interview using a questionnaire. Serum was withdrawn from each study subject and tested for Hepatitis B Surface Antigen (HBsAg) by an enzyme linked immunosorbent assay (ELISA) test kit. Data were analyzed using SPSS version 20.

**Results:** The prevalence of HBV infection among pregnant women attending Benazir Bhutto Hospital, Rawalpindi, was found to be 2.78%.

**Conclusion:** This study determined that the prevalence of HBV infection among pregnant women in Rawalpindi was 2.78%, implying that it is intermediate endemic area.

**Key words:** Hepatitis B, Pregnancy, Prevalence.

Author`s Contribution
*[1] Conception, synthesis, planning of research and manuscript writing Interpretation and discussion*
*[2,3] Data analysis, interpretation and manuscript writing, [4] Active participation in data collection.*

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## Introduction

Hepatitis B infection is caused by hepatitis B virus. It is an enveloped DNA virus that infects liver and causes hepatocellular necrosis and inflammation. HBV infection is one of the serious public health problem worldwide.[1] Many of the carriers do not realize that they are infected with virus rendering the HBV to be known as a “silent killer”. Worldwide, it is estimated that 350 million people are chronically infected with hepatitis B.[2] Recent reports demonstrated that 68,600 people die of HBV infection and globally every year, more than 300,000 deaths are due to liver cancer secondary to hepatitis B.[3] In Pakistan, the situation is worse than in the developed countries of the world. HBV infection is a contagious disease that can be transmitted vertically from mothers to their neonates or horizontally through blood products and body secretions.[4]

Chronic hepatitis B infection in the female population has implications not just for the individual but for her children as well.[5] HBV positive mothers with an HBsAg positive status can vertically transmit the infection to their infants.[6] This risk of transmission may increase, if the mother develops the HBV infection during the third trimester of pregnancy.[7] The prevalence of HBV infection among women of childbearing age may be as high as 2–8 % in China[8] whereas in the USA it is only 0.4 %.[9]

Acute HBV infection during pregnancy is less severe and is not directly associated with increased mortality or teratogenicity.[10] However, increased incidences of low birth weight and prematurity in infants born to mothers with acute HBV infection have been recorded. Furthermore, acute HBV infection in early pregnancy has

been associated with a 10% perinatal transmission rate.[10] Transmission rates as high as 60% have been reported to increase significantly if acute infection occurs at or near the time of delivery.[11] Although there is a safe and effective vaccine, 50 million new cases are diagnosed annually worldwide.[12] Majority of new diagnoses, however, are classified as mother-to-child transmission, especially in regions with high prevalence of the disease.[13] The risk for development of chronic HBV infection is inversely related to the age of exposure. Infants exposed to HBV progress to a chronic infection in 90% of cases, whereas toddlers and young children clear the virus in only 50% of cases.[14] Infection in the adult population, however, is associated with only a 5% rate of progression to chronic disease. In adults, exposure to hepatitis B typically presents with an acute syndrome and viral clearance is more prevalent.[15]

Viral hepatitis during pregnancy is associated with a high risk of maternal complications.[16] Administration of hepatitis B immunoglobulin and hepatitis B vaccine to infants at birth, followed by completion of the vaccine series, prevented approximately 95% of HBV transmission from HBsAg-positive mothers to their infants.[16]

HBV carrier status is relatively common among pregnant women, especially in endemic countries such as Pakistan. However, data on the epidemiology of HBV infection in Pakistan are limited. The magnitude of the problem is not yet addressed in many parts of Pakistan. The present study was planned to determine the prevalence of HBV infection among pregnant women in Rawalpindi district of Pakistan.

## Subjects and Methods

This cross sectional study was conducted at Benazir Bhutto Hospital, Rawalpindi, Pakistan from July 2016 to February 2017. It is a tertiary care hospital that shares a major load of Gynecology & Obstetrics patients and provides antenatal and other specialized obstetric services for the inhabitants of the Rawalpindi district and beyond. The study population was all consecutive pregnant females, who attended antenatal care clinic for check-up services at Benazir Bhutto Hospital, Rawalpindi. Sample size was calculated by using WHO sample size calculator, total of 900 pregnant women were included in the study. All study participants were informed about the study and assured about the confidentiality of data. A written informed consent was obtained from all participants.

Approximately 5 ml of venous blood was collected from each individual in a gel vacutainer by an experienced laboratory technologist. The samples were centrifuged at 2000 revolutions per minutes (rpm) for 5 minutes in order to obtain a clear supernatant serum. The sera were then stored at -20°C prior to the serologic assay of HBV. Screening for HBsAg was performed using HBsAg ELISA kit. It is a solid-phase sandwich- immunoassay, which employs specific monoclonal antibodies and polyclonal antibodies. Protocol for the measurement was done according to the manufacturer's instruction and reading was done at O.D. of 450 nm with an EIA plate reader. The tests ran were validated and results were interpreted according to the manufacturer's instruction. Positive and negative controls were run along with each batch of ELISA test kit. Data were entered into SPSS version 20 for analysis.

## Results

A total of 900 blood samples were collected from pregnant women and then screened for HBV infection using the ELISA kit. Among total of 900 pregnant females, 2.78% (n=25) were positive and 97.2% (n=875) were negative for HBs Antigen.

## Discussion

Hepatitis is considered to be an important public health problem for which reliable screening tests do exist. The hepatitis B virus infection is a common cause of morbidity and mortality globally.[17] It is estimated that about 2 billion people worldwide have serologic evidence of hepatitis B, of which 350 million are chronic carrier.[17] About 1.2 million die annually from chronic hepatitis, cirrhosis, and hepatocellular carcinoma.[18] Of the estimated 350 million chronically infected individuals, about 50% acquired their infections either perinatally or in early childhood.[9] Most pregnant women with HBV infection are chronic carriers.[19] Chronic hepatitis B virus infection due to mother-to-child transmission during perinatal period remains an important public health problem.[20] High rate of mother-to-child transmission of HBV in an endemic country is of concern.[21] Hepatitis B virus infection characterized by HBsAg positivity during pregnancy is a well-recognized issue in developing countries.[22]

The prevalence of chronic HBV infection worldwide is categorized as high (≥8%), intermediate (2–7%), and low (<2%) endimicity.[23] The prevalence of HBV infection varies markedly throughout regions of the world, being

highly endemic in developing regions with large population such as South East Asia, China and sub-Saharan Africa, where at least 8% of the population are HBV chronic carrier.[23] Transmission of HBV from carrier mothers to their babies appears to be the most important factor in determining the prevalence of the infection in high endemic areas.[24] There are three possible routes of transmission of HBV from infected mothers to infants: transplacental transmission of HBV in utero; natal transmission during delivery; or postnatal transmission during care or through breast milk.[24] In developed countries, the incidence of hepatitis is around 0.1% whereas in developing countries it ranges from 3 to 20% and even higher in some areas.[25] In Africa and Asia, the prevalence of HBV is > 8% and 2 billion people have markers of current or past infection with HBV.[26] About half of new infections result from vertical transmission during pregnancy, a statistic that is linked to the fact that HBV screening is not part of routine antenatal care in the area.[25]

In this study, we found that the prevalence of HBsAg among study participants was 2.78%. Overall prevalence of HBV infection among pregnant women in Rawalpindi is intermediate (2.78%) endemic area according to the WHO classification criteria. The frequency of HBsAg among pregnant women in our study was comparable with studies conducted in other parts of world. In a study conducted in KPK (Khaber Pukhtunkhawa), prevalence of HBV in pregnant women was reported to be 1.16%.[27] In a study by Abdi Umare et al, the frequency of HBsAg among study participants was 6.9%.[28] The HBsAg prevalence rate of 3.8% was found among enrolled pregnant participants in Kenya indicating intermediate endemicity.[29] The seroprevalence of HBsAg was 8.3% among pregnant women in Nigeria.[30] Prevalence of HBsAg among pregnant women in China was noted to be 2.5% as reported by Ai-Ming Cui et al.[19]

The American Congress of Obstetrics and Gynecology recommend that every pregnant patient should undergo screening for HBV.[31] All infants require the HBV vaccination series and Hepatitis B immunoglobulin within 12 hours of birth. [31]

## Conclusion

This study shows that Hepatitis B virus infection is of intermediate endemicity in Rawalpindi, with prevalence rate 2.78%. Early screening and detection of infected pregnant females, immunoprophylaxis and surveillance for exposed newborns are essential components of health care system.

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